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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,146	11/15/2001	Michael M. Tilleman	20129.0014U2	5949

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EXAMINER	
LEE, JOHN D	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 10/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/003,146	TILLEMAN ET AL.	
	Examiner	Art Unit	
	John D. Lee	2874	

-- The MAILING DATE of this communication appears on the cover sh et with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *31,33 and 34* is/are allowed.

6)☒ Claim(s) *1-3,5-9,12-14,17,18,22,23,26-30,32,35,37,38 and 40* is/are rejected.

7)☒ Claim(s) *4,10,11,15,16,19-21,24,25,36 and 39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *(3)* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

The four (4) sheets of formal drawing filed on November 15, 2001, are acceptable.

The disclosure is objected to because of the following minor informality: on page 1 of the specification, the reference to "35 U.S.C. § 120" should actually be to "35 U.S.C. § 119(e)". Appropriate correction is required. Applicant's cooperation is requested in correcting any other errors of which applicant may become aware in the specification.

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 12, 13, 22, 23, 27, 28, and 32 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 3, there is no antecedent support for the term "the crystal of the optical sum frequency generator", thus rendering the claim indefinite. It is believed that claim 3 should depend from 2 rather than from claim 1. Claim 12 is indefinite because it is word-for-word identical to claim 4. It is thus impossible to ascertain what further limitations this claim is intended to recite. Claim 13, being dependent upon claim 12, inherently contains the same deficiency. In both claims 22 and 23, there is no antecedent support for the term "the amplifier", thus rendering the claim indefinite. Claim 27 is indefinite because the terminology used therein does not match the terminology used in the claims upon which it depends (23-22-19-1). It is believed that claim 27 should depend from 26 rather than from claim 23. Claim 28 is indefinite because there is no antecedent support for the

term "the crystal of the optical sum frequency generator". It is thus believed that claim 28 should depend from 27 rather than from claim 26. Claim 32 is indefinite since it refers to only a single optical sum frequency generator and a single optical difference frequency generator, when a plurality of same were previously recited. It is suggested that the word "each" be substituted for "the" at the beginning of lines 2 and 4 of this claim.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 14, 26, 29, 30, and 35 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by U.S. Patent 3,636,356 to Giordmaine. As seen in Figure 2B, Giordmaine discloses a device which converts light wavelengths, the device comprising an optical sum frequency generator **22**, an optical difference frequency generator **18**, a continuous wave optical beam source **10**, a splitter/combiner **16** having a first input coupled to a device input from source **12** and a second input coupled to the continuous wave optical beam source **10** and an output coupled to an input of the optical sum frequency generator **22**, and a second splitter/combiner **17b** having a first input coupled

to an output of the optical sum frequency generator **22** and a second input coupled to an output from the first splitter/combiner **16** and an output coupled to the input of the optical difference frequency generator **18**. Linear, orthogonally polarized light is employed in the Giordmaine device. There are also filtering means **20'** for filtering the sum signal, as well as filtering means **24** for filtering the difference signal.

Claims 2, 3, 5-9, 17, 18, 27, 28, 37, 38, and 40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 3,636,356 to Giordmaine. Giordmaine does not disclose the use of periodically-poled nonlinear crystals, although nonlinear crystals are used for the mixing processes. Since the person of ordinary skill in the art would desire optimum phase matching between the various generated beams in the Giordmaine device, it would have been obvious to employ periodically-poled nonlinear crystals therein in order to achieve such a result. This would be in accordance with ordinary knowledge in the art and would thus have been obvious. A depolarizer is also not disclosed in the reference, but since polarized light is used therein, there would be points in the system where it would be advantageous to depolarize the light. The placement of a depolarizer between the device input and the first splitter/combiner **16** of Giordmaine would thus have been obvious. No details are given in the reference regarding the continuous wave optical beam sources (indicated as being shown in block diagram form for simplicity). Since it appears that any such source could be used, it would have been obvious to use a continuous-wave pumped laser, a single-frequency laser diode, a diffraction feedback laser diode, or a tunable continuous-wave laser. Choosing a particular pass frequency range or cutoff frequency for the filtering means

20' and **24** of Giordmaine would have depended upon the desired frequencies of operation and would thus have been obvious to a person of ordinary skill.

Claims 31, 33, and 34 are allowable over the prior art of record. Giordmaine, the closest prior art of record, does not disclose or suggest an integrally formed "plurality" wavelength converter arrangement, along with a multiplexer, as set forth in these claims.

Claims 4, 10, 11, 15, 16, 19-21, 24, 25, 36, and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Giordmaine does not disclose or suggest having the first splitter/combiner **16** and the optical sum frequency generator **22** integrally formed together in a single crystal. Giordmaine also does not disclose or suggest having the second splitter/combiner **17b** and the optical difference frequency generator **18** integrally formed together in a single crystal. Giordmaine further does not disclose or suggest the use of polarization-maintaining single-mode optical fibers. Giordmaine still further does not disclose or suggest the use of amplitude feedback control circuitry (including a controller), or the use of a polarization rotator.

For the same reasons, claims 22, 23, and 32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. § 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

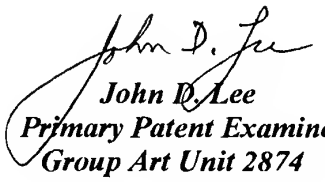
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 5,031,234 to Primas et al describes another optical device which includes, inter alia, signal splitters, an optical sum frequency generator, and an optical difference frequency generator.

All of the prior art documents submitted by applicant in the Information Disclosure Statements filed on April 23, 2002; August 22, 2002; and October 8, 2002, have been considered and made of record (note the attached initialed copy of forms PTO-1449).

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (703) 308-4886. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956, to the technical support staff supervisor (Team 2) at telephone number (703) 308-3072, or to

the Technology Center 2800 Customer Service Office at telephone number (703) 306-3329.



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